



# Twin Cities Business Sector Flood Impacts Survey

Centralia Business and Professional Committee

May 14, 2008

**Dr. Rebekah Green**

Institute for Global and Community Resilience

Western Washington University

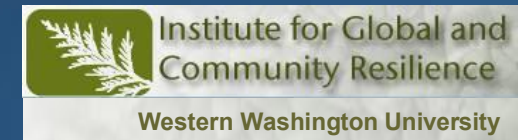
# I. Background

## a. Affiliations

Institute for Global and Community Resilience  
Western Washington University

### Institute for Global and Community Resilience (IGCR)

- Western Washington University
- Support undergraduate study of disaster reduction and emergency planning



**Mission:** *The IGCR facilitates scholarship, education, and practice on reducing social and physical vulnerability through sustainable community development, as well as minimizing loss and enhancing recovery from disasters in Washington State and its interdependent global communities.*

### Quick Response Grant

- Natural Hazards Center
- \$2500 for survey and travel expenses





# I. Background

## b. Research Purpose

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### **Business Recovery Study**

- Document business recovery from frequent flooding

### **Research Questions**

- How are businesses impacted by floods?
- How do they recover?
- What types of businesses engaged in flood preparedness activities and was it helpful?



Photo Credit [The Oregonian](http://pomomusings.com/2007/12/05/chehalis-wa-floods/) <http://pomomusings.com/2007/12/05/chehalis-wa-floods/>

## II. A Bit of Context

## III. Survey Results

- a. Risk Perception and Preparedness
- b. Impacts and Damage
- c. Recovery

## IV. Where to go from Here?

**WESTERN**  
WASHINGTON UNIVERSITY

Institute for Global & Community Resilience  
Disaster Reduction & Emergency Planning  
Investigators: Rebekah Green, Scott Miles, Jason Levy

**BUSINESS RECOVERY FROM FLOOD DISASTER QUESTIONNAIRE**

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## II. A Bit of Context

### a. What We Already Know

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#### Recovery takes time

- Measured in years not months (Alesch 2001)

#### Recovery is not certain

- At least 25% of all businesses that close for a disaster never reopen  
(Institute for Business and Home Safety)
- Over 60% of businesses confronted by a major disaster close by two years  
(Assoc. of Records Managers and Administrators)

#### Recovery may require adaptation

- Examples from Katrina
  - superdome supplier
  - gourmet culinary institute



## II. A Bit of Context

### a. What We Already Know

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Western Washington University

#### Business Sector ~~Recovery~~ Survival

- Return to *status quo* often an illusion
- Understanding that physical repair is only part of recovery
- A struggle to achieve viability in a new and changing environment
- A function of ability to adapt to new environment



San Francisco business district before earthquake, History Center, SF Public Library



Open for business after 1906 earthquake, [www.OutsideLands.org](http://www.OutsideLands.org)



California Street, SF Business District after the 1906 Earthquake



## II. A Bit of Context

### b. Who Survives

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#### Who Will Survive?

- How much are customers affected?
  - ✓ Advantage for manufacturing, those with diverse clientele
  - x Disadvantage to locally oriented businesses serving those most impacted
- Do customers still need product in post-disaster environment?
  - ✓ Advantage for suppliers of building supplies, inexpensive food and basic needs
  - x Disadvantage to suppliers who depend upon discretionary income (typically diverted to remodel and basic needs)



Mobile One standing vacant one year after Hurricane Katrina  
<http://www.12volt.com/archives/2006/081606.html>



Cleaning, gutting, and construction service advertisements, New Orleans  
<http://www.12volt.com/archives/2006/081606.html>

## II. A Bit of Context

### b. Who Survives

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#### Who Will Survive?

- How will market trends exacerbated by disaster affect business?
  - xDisadvantage when customers do not depend upon a single supplier
  - xDisadvantage when product, location or supply method or primary customer base becoming outmoded
- To what extent did the business loose critical production, inventory or capital asset?
  - ✓Advantage for businesses suffering limited loss



Damaged business, New Orleans



## II. A Bit of Context

### b. Who Survives

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### Who Will Survive?

- How able is the business owner/operator able to recognize changes in post-disaster environment and adapt?
  - ✓ Advantage for innovative and adaptive owners/operators, especially those who can address post-disaster needs



Reopening after Hurricane Katrina,  
Intelligent Travel

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## II. Research Method

### a. Focus, Selection and Strategy

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#### Research Focus

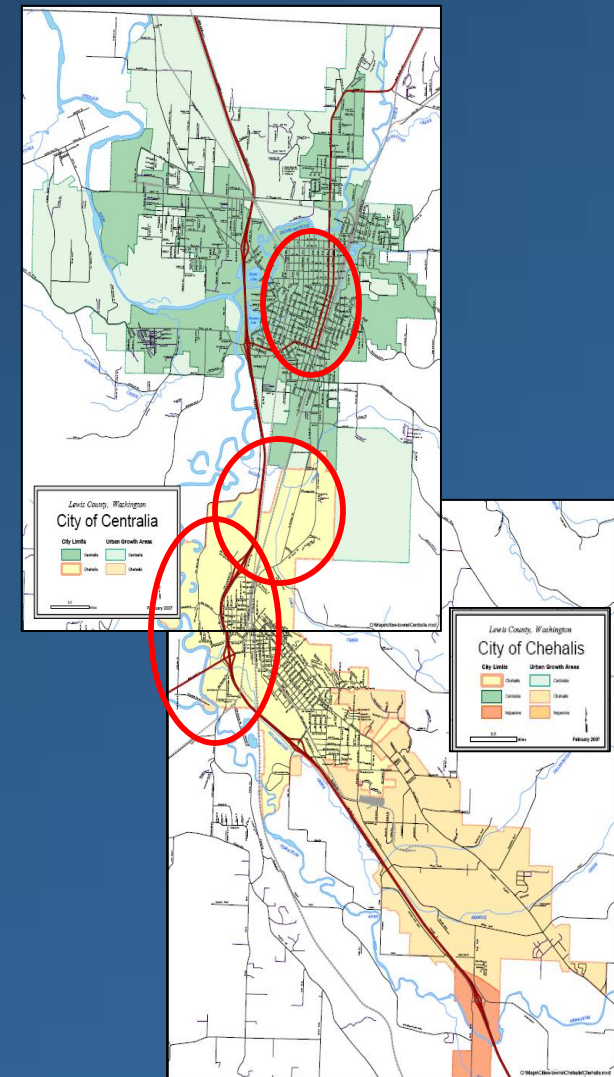
- Geography: Twin Cities
- Sector: Retail, Manufacturing, Service
- Both direct and indirect impacted

#### Business Selection

- Develop list of 160 businesses
  - Centralia/Chehalis Offices of Economic Development
  - Downtown Business Association
- Randomized selection from list

#### Research Strategy

- Phone invitation
- About 8% of numbers called were disconnected
- On site survey, February 22, 2008
- 16 student volunteers





## II. Research Method

### b. Businesses Surveyed

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#### Demographics

- 63 out of 160 sample surveyed
  - 37 flooded businesses\*
  - 26 unflooded businesses
- Close to 60% retail and trade; 20% service and food
- Most had a local customer base\*\*
  - 90% of flooded businesses said they had a local customer base
  - 70% unflooded businesses said they had a local customer base

	Flooded	Unflooded
Businesses Surveyed	37	26
Median No. of Employees	6 employees	3.5 employees
Avg. Length of Operation	19 years	18 years
Previously flooded	41%	4 %

\*For 22 of the flooded businesses this was their first flood experience.

\*\*When compared to the unflooded businesses, flooded business are significantly more likely to have a local customer base (based upon 0.1 level of significance).

### III. Survey Results

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### III. Survey Results

#### a. Risk Perception and Preparedness

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#### Risk Perception

- Most flooded and unflooded business owners did not know if they were inside or outside the 100 year flood plain\*

	Flooded	Unflooded
Businesses Surveyed	37	26
<b>Knew whether business was in 100 yr floodplain</b>	64%	46%

\*There was no significant difference in knowledge regarding flood plane location between the surveyed flooded and unflooded businesses.



### III. Survey Results

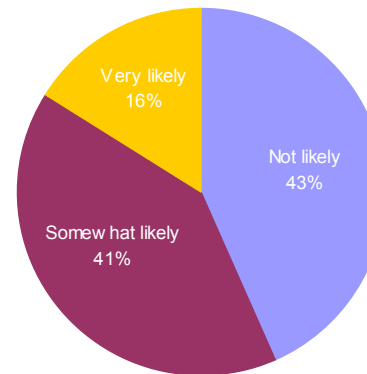
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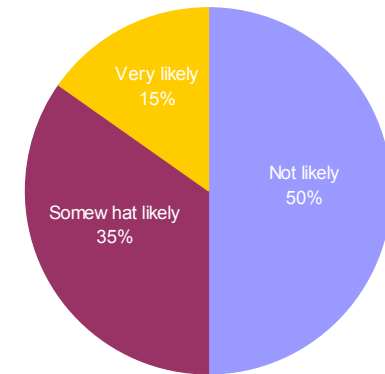
## Risk Perception

- Flooded vs. Unflooded:
  - Very few believed flooding was somewhat or very likely
  - No significant difference in belief in flooding between flooded and unflooded businesses
- Previously Flooded vs. Previously Unflooded:
  - Previously flooded businesses were more likely to believe flooding was likely

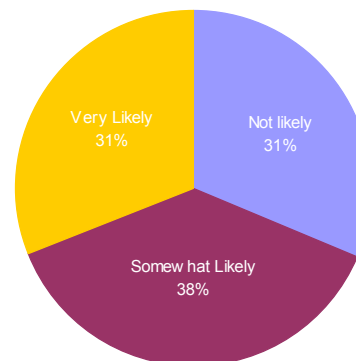
Flooded Businesses



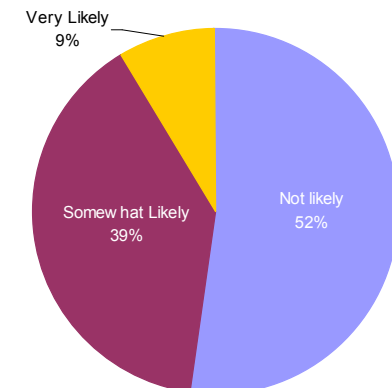
Unflooded Businesses



Previously Flooded



Previously Unflooded



### III. Survey Results

#### a. Risk Perception and Preparedness

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#### Preparedness

- Large differences between previously flooded businesses and other businesses
  - Making business emergency plans
  - Making arrangements to move stock
- Businesses flooded for the first time hadn't done as much as those with previous flood experience (steep learning curve)
- Insurance coverage high, flood coverage low for all surveyed

	Flooded, not first time	Flooded, first time	Unflooded
Talked with neighbors			
Consulted with a professional			
Read info on preparedness			
Informed employees			
Business emergency plan*			
Make arrangements to move stock			
Renovate to make flood resistant			
Back up fuel or generator			
Insurance coverage			
Flood coverage			

### III. Survey Results

#### a. Risk Perception and Preparedness

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#### Ranked activities by cost/time investment

Example:

*Business ABC* consulted with an engineer and read information on preparedness (Score:  $3 + 1 = 4$ )

#### Business characteristics that predict preparedness activity

- Previously flooded businesses\*
- Locally-oriented businesses\*\*
- Older businesses\*\*
- ~~Business size~~

Activities	Score
Inform employees	1
Read info	1
Talk w/ neighbors	1
Emergency plan	2
Move inventory/operation	2
Consult w/ engineer	3
Fuel/generator	3
Flood insurance	4
Renovate	5

Linear regression analysis:

\*Significant to the 0.0001 level; \*\*Significant at the 0.1 level



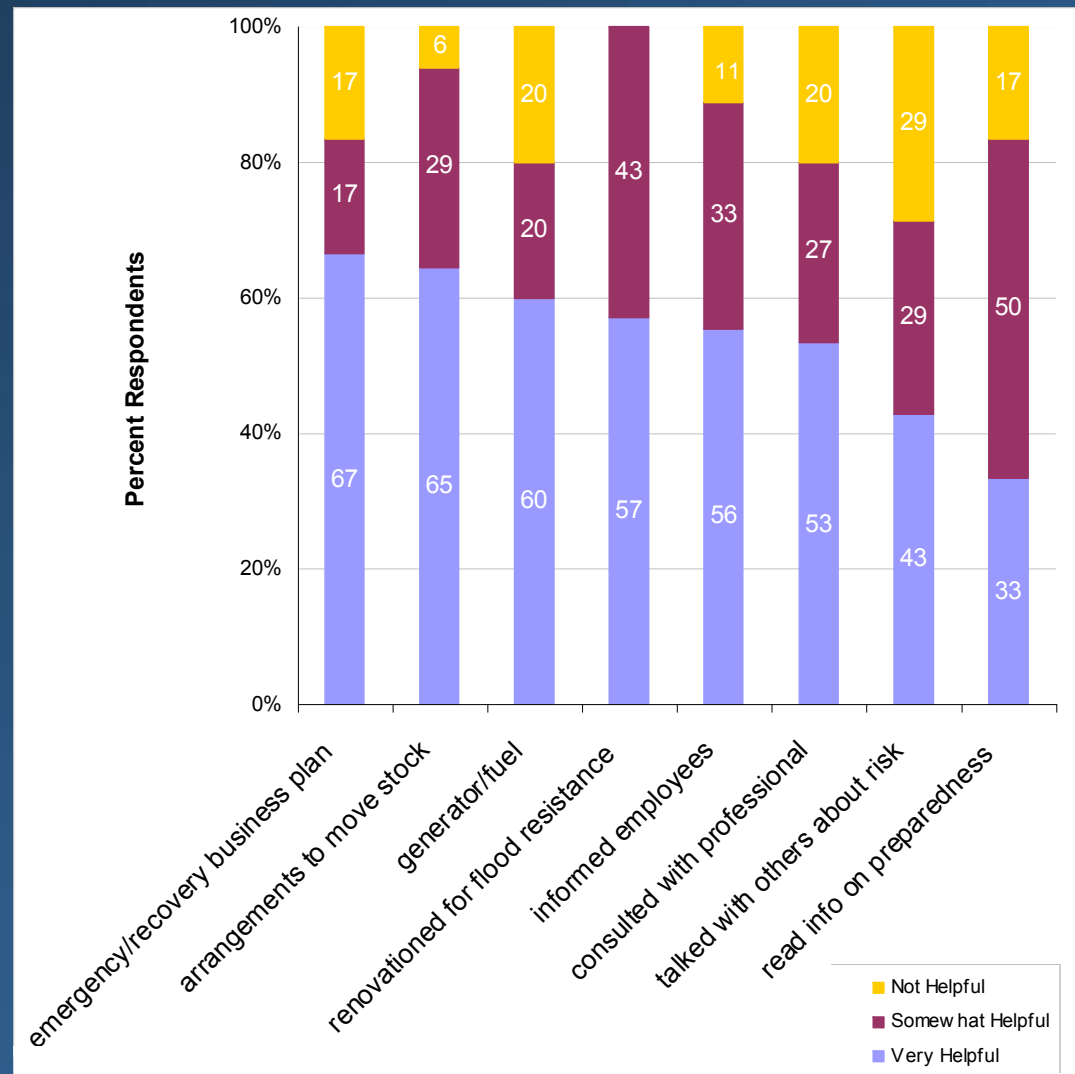
### III. Survey Results

#### a. Risk Perception and Preparedness

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#### How helpful was preparation?

- Emergency/recovery business plan rated as most helpful
- Info on preparedness rated least helpful



### III. Survey Results

#### a. Risk Perception and Preparedness - What's Important?

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##### **What we see as important**

- Less than half previously flooded businesses with flood insurance
- Businesses with flood experience had engaged in much more protective measures
- Business disaster/emergency planning seen as most helpful preparedness activity

##### **Questions that still remain**

- Why might flood insurance coverage be low? (didn't understand policies, bad agent advice, bad experience with insurance in the past, too expensive, something else?)

### III. Survey Results

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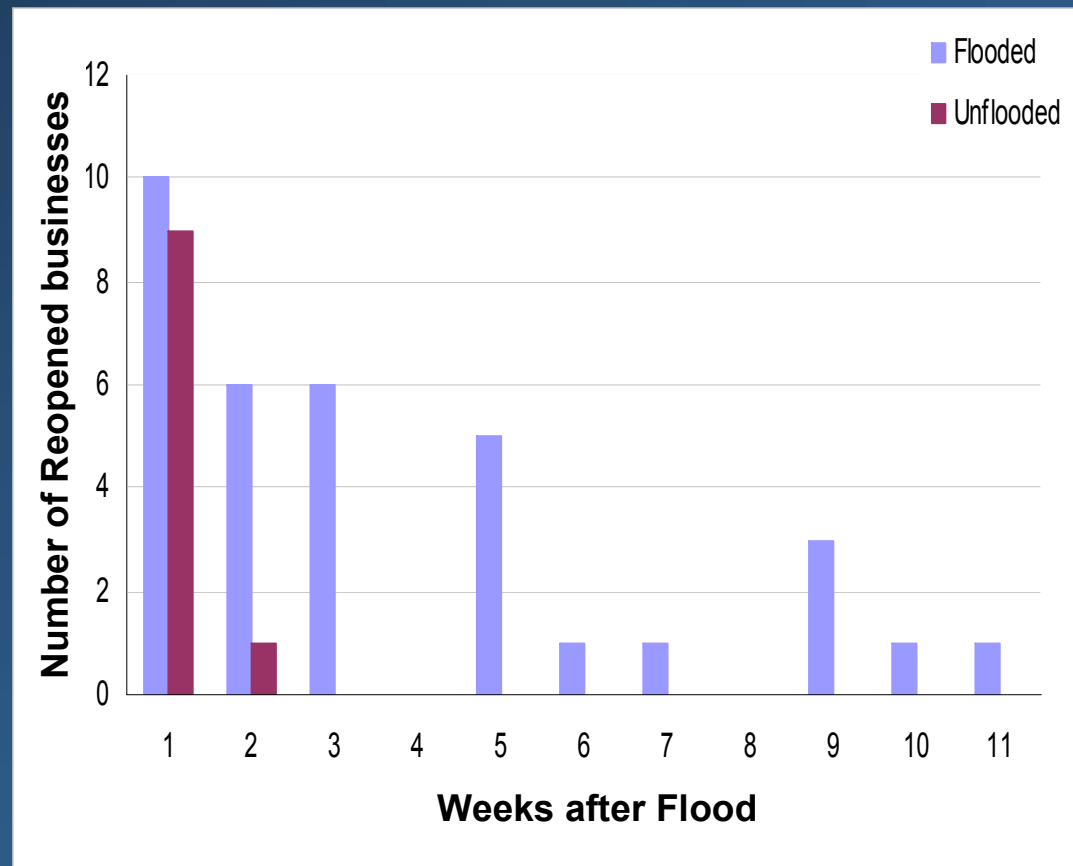
### III. Survey Results

#### b. Impacts and Disruptions

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#### Closure and Reopening

- Almost 100% of flooded business and 40% of unflooded were forced to close\*
- All unflooded businesses reopened within the first two weeks of closing
- A little over 70% of flooded businesses reopened within 5 weeks of closing; 3% remained closed at the time of the survey



\* Difference between flooded and unflooded businesses significant at the  $p=.001$  level

### III. Survey Results

#### b. Impacts and Disruptions

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#### Flood Damage

- Flood water and debris damaged inventory, equipment, and facilities
- Closures and damage led to loss of sales

	Average gross approximate percent annual sales for flooded businesses
Inventory loss	~10%
Equipment loss	~15%
Sales loss	~15%

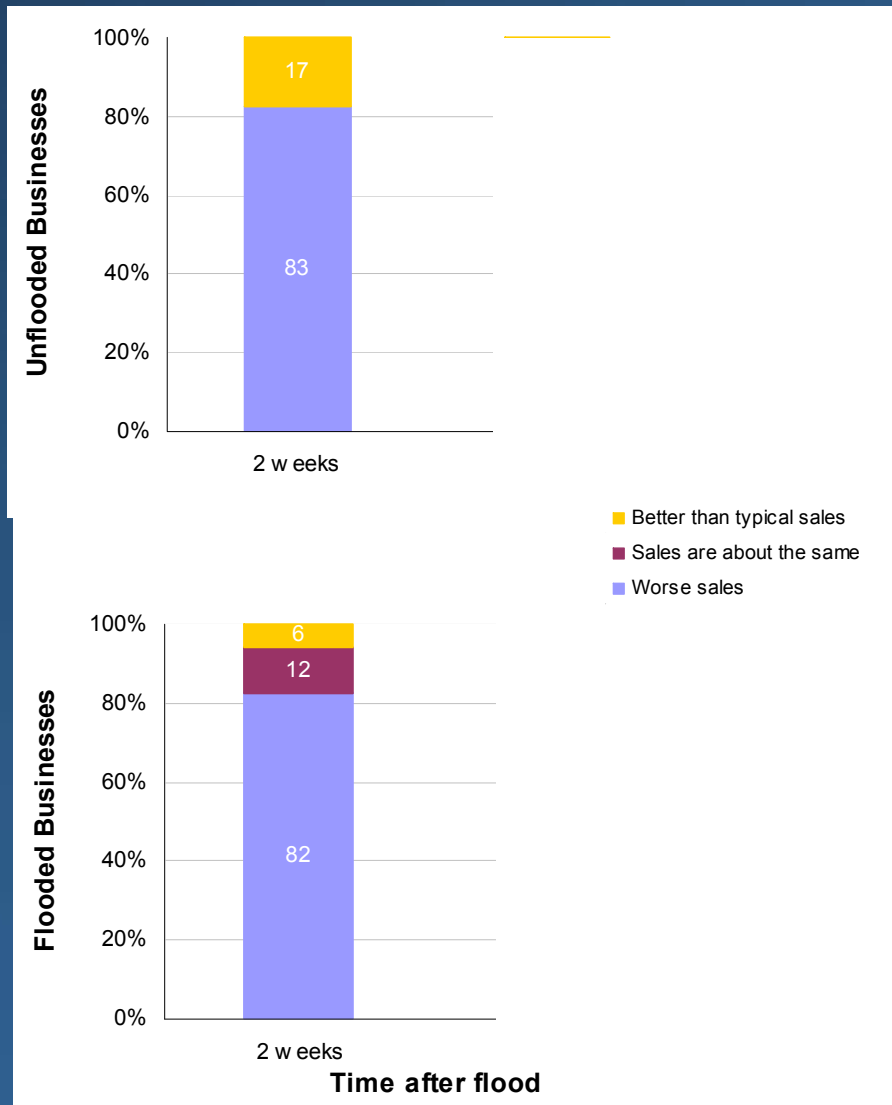
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#### Sales Conditions

- Two weeks post flood
  - Flooded and unflooded had worse than normal sales
  - Significant **indirect impacts** to unflooded businesses
- Two months post flood
  - Improvement for both groups
  - Slightly less flooded businesses returning to normal sales level



### III. Survey Results

#### a. Impact and Disruption

##### - What's Important?

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#### **What we see as important**

- Significant impacts even for unflooded businesses
- Impact on sales is not uniform, some do better

#### **Questions that still remain**

- Was the drop in sales for unflooded businesses more a result of loss of local customer purchasing power or loss of customers due to perceived damage?
- The survey results suggested about ~15% drop in annual sales due to the flood. Has this leveled off or continued to increase?

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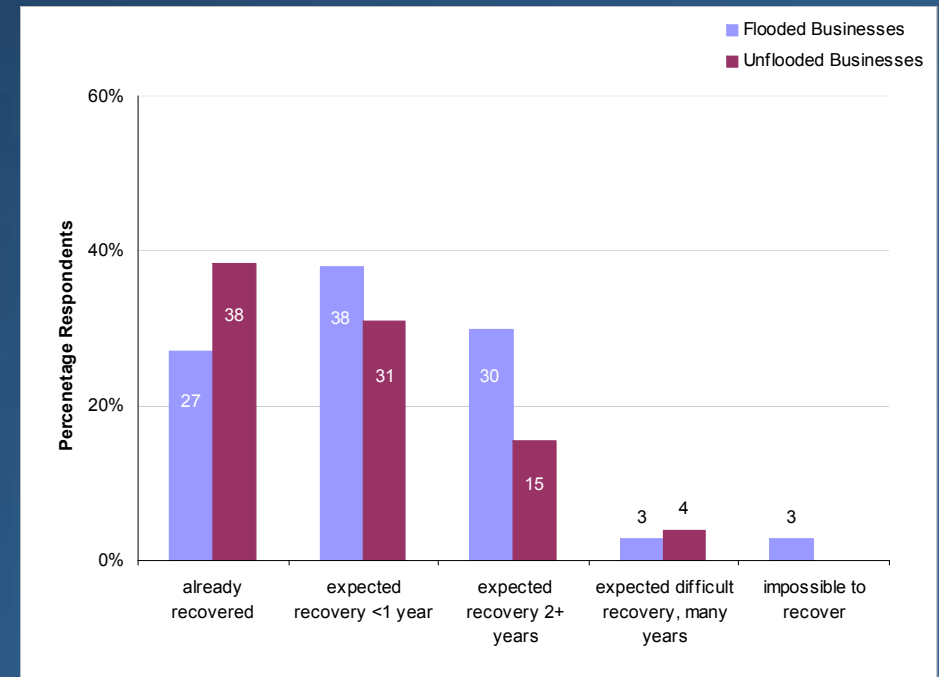


### III. Survey Results

#### c. Recovery

#### Expected Recovery

- 27% of flooded businesses believe they have already recovered
- 38% of flooded businesses expect to recover within a year
- 30% of flooded businesses expect recovery will take two or more years
- Few flooded businesses deem recovery to be extremely difficult or impossible
- Many unflooded businesses expect recovery to also take considerable time



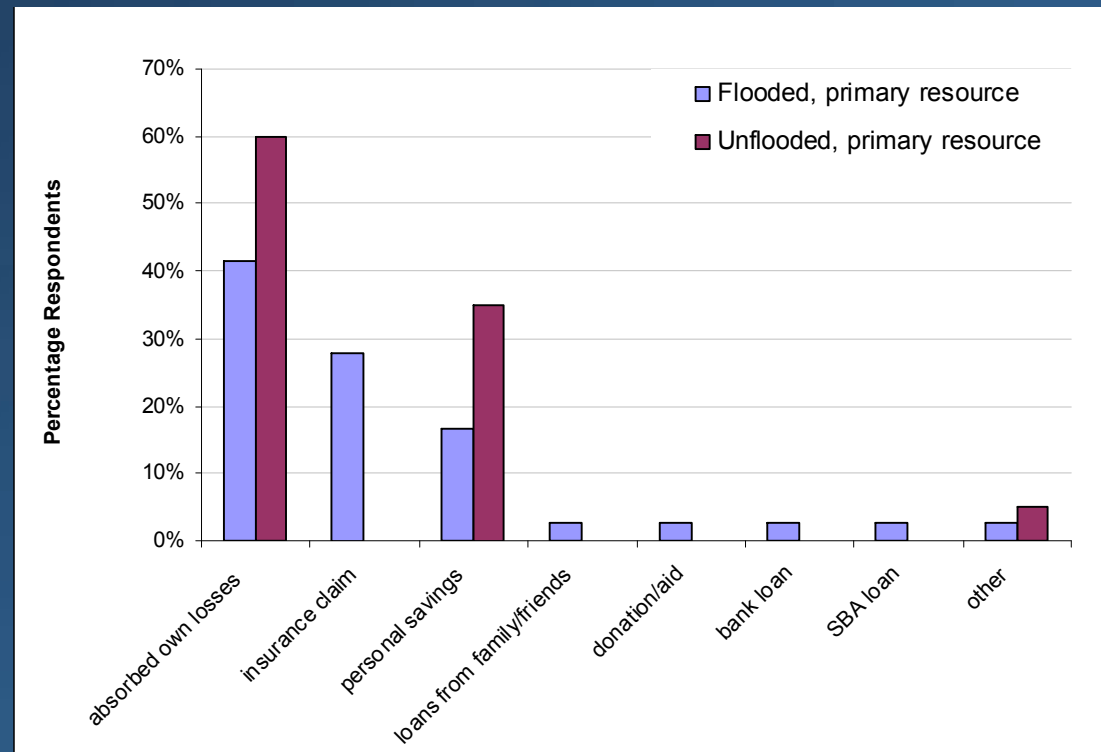
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## Resources for Recovery

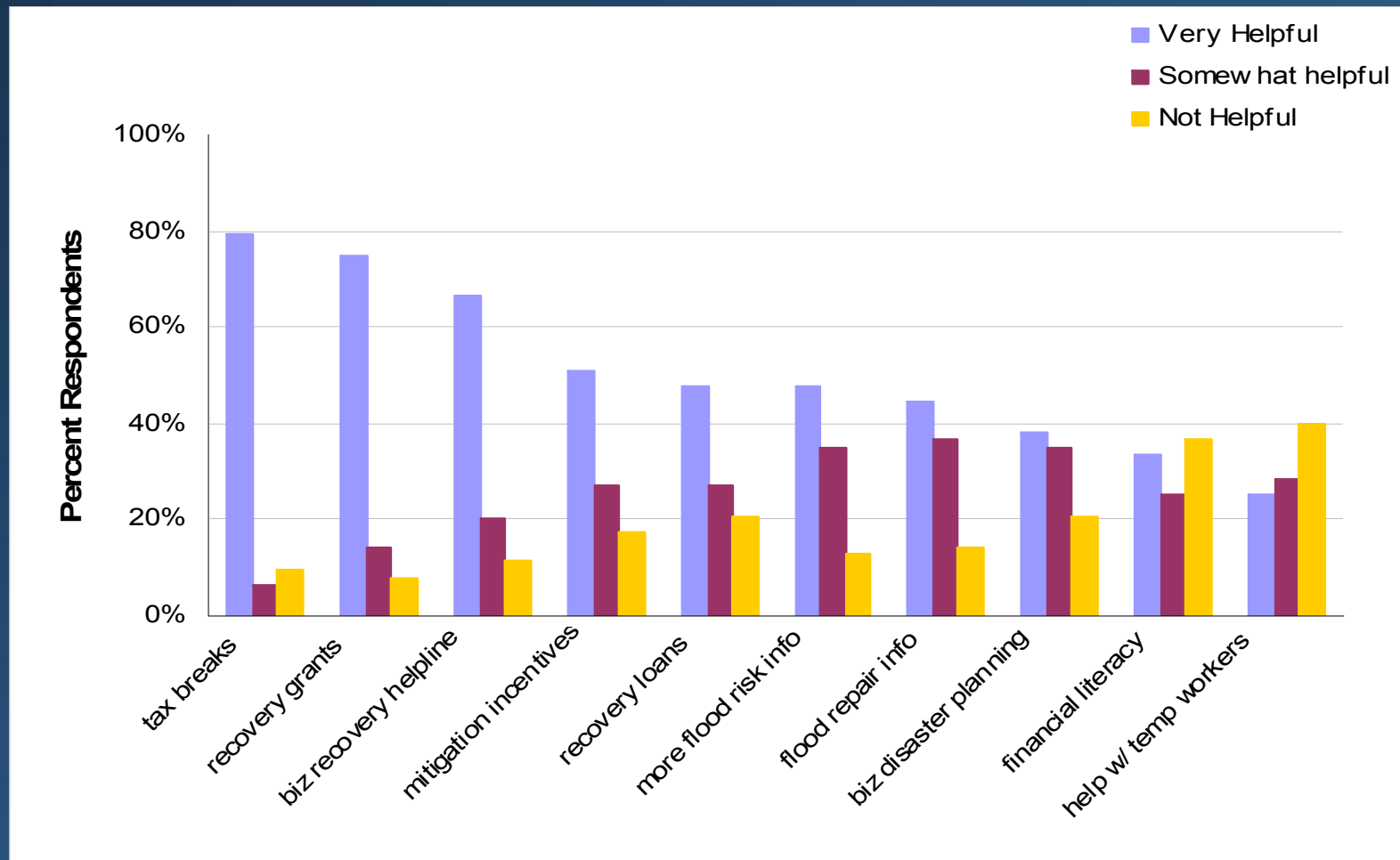
- The top ranking primary financial resource was “just absorbing their own losses”
- Second ranked resource was flood insurance for flooded businesses
- Many unflooded businesses relying upon personal savings to cover losses



### III. Survey Results c. Recovery

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#### Government Action

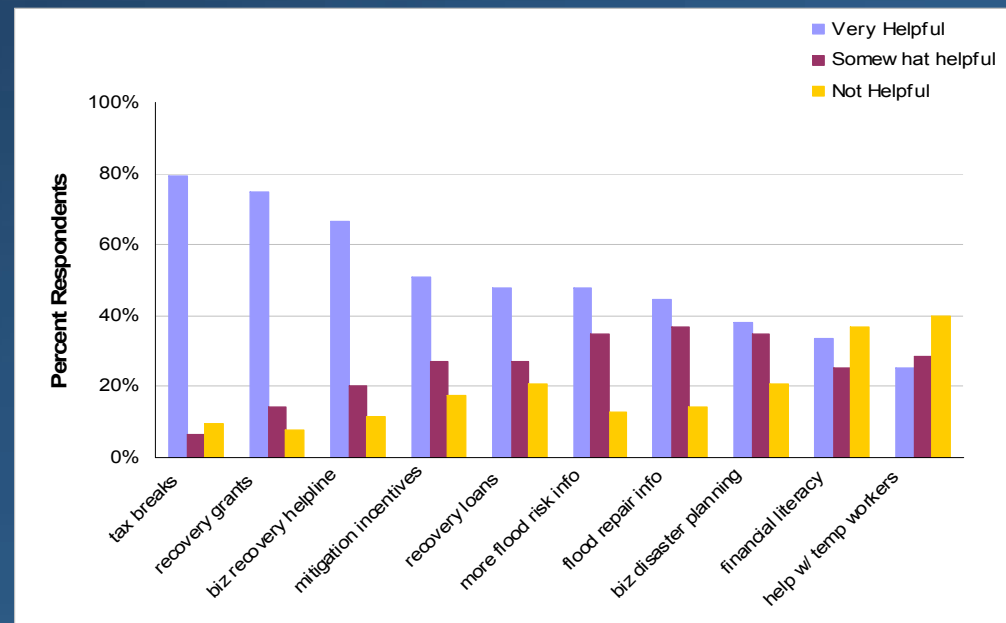


### III. Survey Results

#### c. Recovery

#### Government Action

- Over three quarters of all businesses thought tax breaks would be very helpful
- Three quarters said grants would be very helpful
- Two thirds said a business recovery helpline would also be helpful
- Business emergency plan was rated low



### III. Survey Results

#### a. Recovery

##### - What's Important?

#### **What we see as important**

- Businesses overwhelmingly used internal sources to finance recovery
- Business disaster planning ranked low on list of ways government could support business community, even though those who had done it in the past found it very helpful

#### **Questions that still remain**

- Has recovery financing changed? Are more businesses applying for formal assistance like SBA loans now?
- Why did business owners rate information on biz disaster planning as not very helpful? (not useful for standard business practice, don't have time, disasters are not that hard to deal with, its intuitive so don't need more info, something else?)



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b. No → How long have you been at this location? \_\_\_\_\_ years, or since \_\_\_\_\_

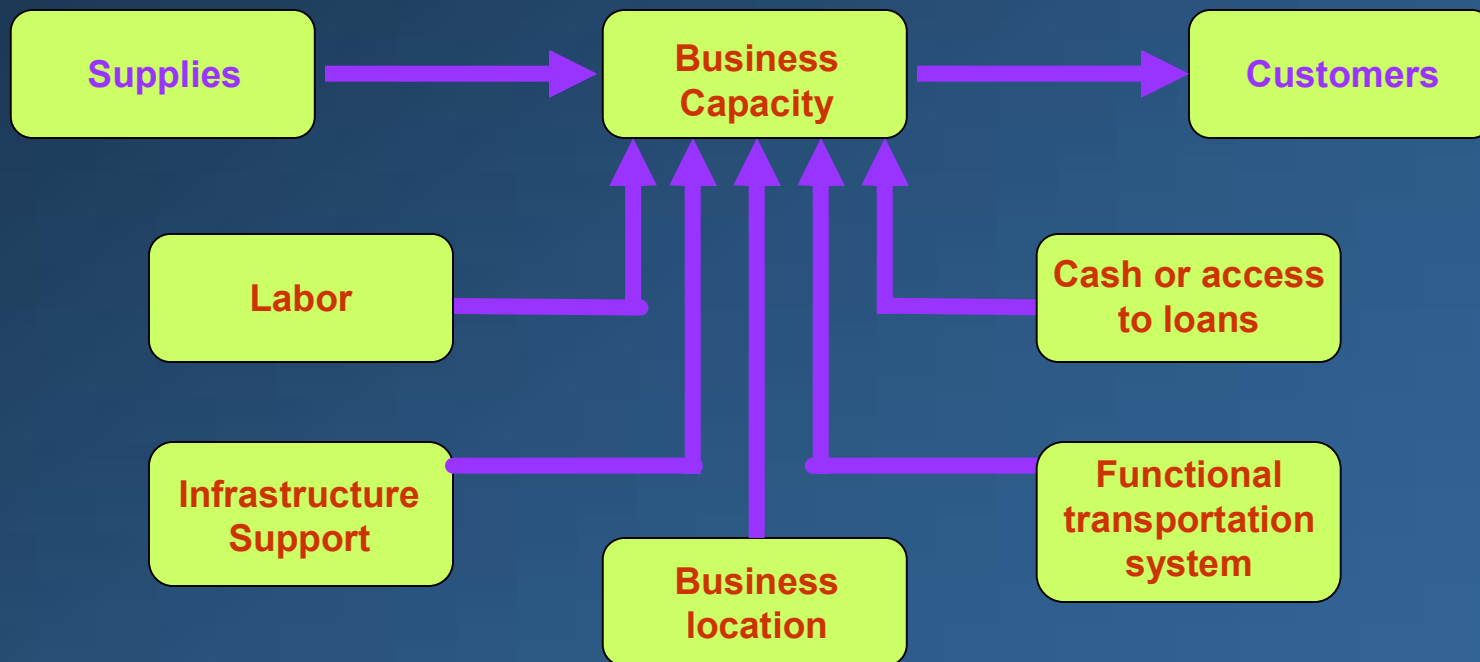
Green, R., Miles, S. and J. Levy. 2008. Business Recovery Related to High Frequency Natural Hazard Events. Quick Response Research Report 197. Boulder, CO: University of Colorado Natural Hazards Center. [http://www.colorado.edu/natural\\_hazards/quick\\_response\\_research/197](http://www.colorado.edu/natural_hazards/quick_response_research/197)

## IV. Where to go from Here?

### a. What is recovery

Recovery is **NOT** simply rebuilding and restoring . . .

#### The Seven Critical Cords of Business Survival (Alesch)



. . .recovery is reconstructing connections.

## IV. Where to go from Here?

### b. Questions

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Western Washington University

## Where to go from here?

Q. What message do you think other business communities should hear about disasters and reducing their impacts?

Q. What message do you think policy makers should hear about businesses and disasters?



## IV. Where to go from Here?

### b. Questions

Institute for Global and Community Resilience  
Western Washington University

## Where to go from here?

Q. What would make running a business in the flood plain more manageable?

- Gov't actions
- Business community actions
- Individual business actions



# Thank You!

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### III. Survey Results

#### a. Risk Perception and Preparedness

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##### Preparedness

- Approximately a quarter of both groups consulted with a professional
- Less than one fifth read information on preparedness
- More flooded businesses had emergency plans, likely due to past experience with flooding\*
- Less than half of businesses had flood insurance

	Flooded	Unflooded
Talked with neighbors	54%	42%
Consulted with a professional	24%	27%
Read info on preparedness	19%	23%
Informed employees	62%	27%
Business emergency plan	46%	12%
Make arrangements to move stock	43%	19%
Renovate to make flood resistant	16%	4%
Back up fuel or generator	14%	12%
Insurance coverage	69%	76%
Flood coverage	38%	12%
Business interrupt coverage	29%	40%

\*Prior to the December floods, flooded businesses were significantly more likely than unflooded to have a formal business emergency or disaster plan (based on a 0.001 level of significance).